WHAT IS CLAIMED IS:

1. A method for making cylindrical glass preforms with convex, optical quality end surfaces comprising the steps of:

(a) placing a glass ball preform between an upper and a lower platen;

(b) raising the temperature of the glass ball preform to a temperature above the glass transition temperature of the glass ball preform; and

(c) simultaneously rolling and compressing the glass ball preform between the upper platen and the lower platen until a predetermined gap between the upper and lower platen is achieved.

2. A method for making cylindrical glass preforms with convex, optical quality end surfaces comprising the steps of:

(a) placing a glass ball preform on a heated lower platen;

(b) raising the temperature of the glass ball preform to a temperature above the glass transition temperature of the glass ball preform;

(c) engaging the glass ball preform with an upper platen; and

(d) moving at least one of the upper and lower platen to cause a gap between the upper and lower platen to narrow to a predetermined dimension and simultaneously to cause the glass ball preform to roll between the upper and lower platen to form a cylindrical preform having a predetermined diameter, the cylindrical preform having convex, optical quality end surfaces.

3. A method for making cylindrical glass preforms with convex, optical quality end surfaces comprising the steps of:

(a) placing a glass ball preform on a heated lower platen;

(b) lowering the viscosity of the glass ball preform to be in a range of from about 10^4 to about 10^8 poise;

(c) engaging the glass ball preform with an upper platen;

(d) effecting relative lateral movement between the upper platen and the lower platen;

(e) effecting relative vertical movement between the upper platen and the lower platen to cause a gap between the upper platen and the lower platen to narrow to a predetermined dimension; and

(f) rolling the glass ball preform between the upper and lower platen to form a cylindrical preform having a predetermined diameter, the cylindrical preform having convex, optical quality end surfaces.

4. A method for making cylindrical glass preforms with convex, optical quality end surfaces comprising the steps of:

(a) placing a glass ball preform on a heated lower platen;

(b) raising the temperature of the glass ball preform to a temperature above the glass transition temperature of the glass ball preform;

(c) engaging the glass ball preform with an upper platen;

(d) effecting relative lateral movement between the upper platen and the lower platen;

(e) effecting relative vertical movement between the upper platen and the lower platen to cause a gap between the upper platen and the lower platen to narrow to a predetermined dimension; and

(f) rolling the glass ball preform between the upper platen and the lower platen to form a cylindrical preform having a predetermined diameter, the cylindrical preform having convex, optical quality end surfaces.

5. A method as recited in claim 2 further comprising the step of:

lowering the temperature of the cylindrical preform to below the glass transition temperature thereof;

removing the cylindrical preform from the lower platen.

6. A method as recited in claim 2 wherein:

the step of raising the temperature of the glass ball preform is performed by placing the glass ball preform in a heated venturi.

7. A method as recited in claim 6 further comprising the step of:

operating the venturi with an inert gas.

8. A method as recited in claim 2 wherein:

the upper platen is generally parallel to the lower platen.

9. A method as recited in claim 2 wherein:

said moving step is performed by rotating at least one of the upper platen and the lower platen while simultaneously narrowing the gap between the upper platen and the lower platen.

10. A method as recited in claim 5 wherein:

the step of lowering the temperature of the cylindrical preform is performed by effecting a temperature gradient across a portion of the lower platen after the predetermined diameter has been achieved such that the temperature of the cylindrical preform is lowered to the glass transition temperature thereof prior to the removing step.

11. An apparatus for making cylindrical glass ball preforms with convex, optical quality end surfaces comprising the steps of:

(a) a lower platen on which a glass ball preform is placed;

(b) an upper platen which is generally parallel to the lower platen, the upper and/or lower platen being movable relative to one another in a vertical direction and a horizontal direction;

(c) means for heating the glass ball preform to above a glass transition temperature thereof; and

(d) means for setting a final gap between the upper platen and the lower platen, the final gap controlling the diameter of the cylindrical glass ball preforms, relative vertical movement between the upper and lower platen allowing the glass ball preform to be engaged between respective rolling surfaces of the upper platen and the lower platen, relative horizontal movement between the upper platen and the lower platen causing the glass ball preform to roll between the respective rolling surfaces of the upper platen and the lower platen.

12. An apparatus as recited in claim 11 wherein:
the means for heating the glass ball preform is a heated venturi.

13. An apparatus as recited in claim 11 further comprising:
heaters for raising the temperature of the upper platen to predetermined levels.

14. An apparatus as recited in claim 11 further comprising:
heaters for generating a lateral temperature gradient across the upper platen and the lower platen.

15. An apparatus as recited in claim 12 wherein:
the venturi is operated with an inert gas.

16. An apparatus as recited in claim 11 wherein:
the upper platen is generally parallel to the lower platen.

17. An apparatus as recited in claim 11 wherein:
relative horizontal movement between the upper platen and the lower platen is performed by rotating at least one of the upper platen and the

lower platen and relative vertical movement between the upper platen and the lower platen is performed to narrow the gap between the upper platen and the lower platen.

18. A method as recited in claim 1 wherein:
the upper platen is generally parallel to the lower platen.

19. A method as recited in claim 1 wherein:
said rolling and compressing steps are performed by rotating at least one of the upper platen and the lower platen while simultaneously narrowing the gap between the upper platen and the lower platen.